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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09 939,466	08 23 2001	Rui-Fang Shi	155635-0168	3663

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EXAMINER

STAFIRA, MICHAEL PATRICK

ART UNIT PAPER NUMBER

2877

DATE MAILED: 07 01 2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/939,466

Applicant(s)

SHI ET AL.

Examiner

Michael P. Stafira

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 22-28 is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s) ____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____ 6) ☐ Other

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-3, 5, 8-10, 12, 15-17, 19 are rejected under 35 U.S.C. 102(e) as being anticipated by Liu et al. ('504).

Claim 1

Liu et al. ('504) discloses a transparent substrate (Fig. 2d, Ref. 31) that has a first surface and an opposite second surface (Col. 5, lines 41-42); a coating (Fig. 2d, Ref. 32) on the first surface of the transparent substrate (Col. 5, lines 45-48), wherein a thickness of the coating is substantially inversely proportional to a refractive index of the coating (Col. 7, lines 42-51, 65-67). The reference of Liu et al. ('504) fully discloses that the thickness of the coating inversely proportional to the refractive coefficients through the use of the mathematical equations disclosed in the patent.

Claim 2

The reference of Liu et al. ('504) further discloses that the thickness of the coating is further substantially proportional to a wavelength of light used in the tester (Col. 7-8, lines 63-2).

Claim 3

Liu et al. ('504) further discloses the coating is transparent (Col. 5, lines 44-48).

Claim 5

The reference of Liu et al. ('504) further discloses that the substrate is a glass material (Col. 5, lines 41-42) and the transparent coating is a diamond-like-carbon material (Col. 5, lines 45-48).

Claim 8

Liu et al. ('504) discloses a transparent substrate (Fig. 1, Ref. 31) that has a first surface and an opposite second surface (Col. 5, lines 41-42); a coating (Fig. 1, Ref. 32) on the first surface of the transparent substrate (Col. 5, lines 45-48) the coating being adjacent to the recording head (Fig. 1, Ref. 34), wherein a thickness of the coating is substantially inversely proportional to a refractive index of the coating (Col. 7, lines 42-51, 65-67). The reference of Liu et al. ('504) fully discloses that the thickness of the coating inversely proportional to the refractive coefficients through the use of the mathematical equations disclosed in the patent. The reference further discloses a light source (Fig. 1, Ref. 70) that directs a beam of light through the transparent substrate (Fig. 1, Ref. 31) and the coating (Fig. 1, Ref. 32) and onto the recording head (Fig. 1, Ref. 34), wherein the beam of light is reflected from the recording head (Fig. 1), and a photodetector (Fig. 1, Ref. 78) that detects the reflected light beam (Col. 4-5, lines 62-27).

Claim 9

The reference of Liu et al. ('504) further discloses that the thickness of the coating is further substantially proportional to a wavelength of light used in the tester (Col. 7-8, lines 63-2).

Claim 10

Liu et al. ('504) further discloses the coating is transparent (Col. 5, lines 44-48).

Claim 12

The reference of Liu et al. ('504) further discloses that the substrate is a glass material (Col. 5, lines 41-42) and the transparent coating is a diamond-like-carbon material (Col. 5, lines 45-48).

Claim 15

Liu et al. ('504) discloses a process for providing transparent substrate (Fig. 2d, Ref. 31) that has a first surface and an opposite second surface (Col. 5, lines 41-42); attaching a layer (Fig. 2d, Ref. 32) on the first surface of the transparent substrate (Col. 5, lines 45-48), wherein a thickness of the coating is substantially inversely proportional to a refractive index of the coating (Col. 7, lines 42-51, 65-67). The reference of Liu et al. ('504) fully discloses that the thickness of the coating inversely proportional to the refractive coefficients through the use of the mathematical equations disclosed in the patent.

Claim 16

The reference of Liu et al. ('504) further discloses that the thickness of the coating is further substantially proportional to a wavelength of light used in the tester (Col. 7-8, lines 63-2).

Claim 17

Liu et al. ('504) further discloses the coating is transparent (Col. 5, lines 44-48).

Claim 19

The reference of Liu et al. ('504) further discloses that the substrate is a glass material (Col. 5, lines 41-42) and the transparent coating is a diamond-like-carbon material (Col. 5, lines 45-48).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 4,6,7,11,13,14,18,20,21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liu et al. ('504).

Claim 4

Liu et al. ('504) discloses the claimed invention except for the coating has a hardness that is greater than that of the substrate. It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine Liu et al. ('504) with hardness since it was well known in the art that having the hardness greater than the substrate protects the substrate from damage and abrasion.

Claims 6 & 7

Liu et al. ('504) discloses the claimed invention except for the diamond-like-carbon material is hydrogenated or nitrogenated. It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine Liu et al. ('504) with the diamond-

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like-carbon that is hydrogenated or nitrogenated, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

Claim 11

Liu et al. ('504) discloses the claimed invention except for the coating has a hardness that is greater than that of the substrate. It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine Liu et al. ('504) with hardness since it was well known in the art that having the hardness greater than the substrate protects the substrate from damage and abrasion.

Claim 13 & 14

Liu et al. ('504) discloses the claimed invention except for the diamond-like-carbon material is hydrogenated or nitrogenated. It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine Liu et al. ('504) with the diamond-like-carbon that is hydrogenated or nitrogenated, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

Claim 18

Liu et al. ('504) discloses the claimed invention except for the coating has a hardness that is greater than that of the substrate. It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine Liu et al. ('504) with hardness since it was well known in the art that having the hardness greater than the substrate protects the substrate from damage and abrasion.

Claims 20 & 21

Liu et al. ('504) discloses the claimed invention except for the diamond-like-carbon material is hydrogenated or nitrogenated. It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine Liu et al. ('504) with the diamond-like-carbon that is hydrogenated or nitrogenated, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

Response to Arguments

5. Applicant's arguments filed May 16, 2003 have been fully considered but they are not persuasive.

Applicant argues on page 3 of the amendment dated 5/16/2003 that the 102(e) rejection of independent claims 1, 8, 15 over the cited reference of Liu fails to disclose that the substrate coating with a thickness that is substantially inversely proportional to a refractive index of the coating as disclosed in the claimed limitation.

Examiner argues that the reference of Liu is using the same type of substrate coating (DLC) in the same thickness range of 3-40 nm and therefore, would inherently produce the thickness is substantially inversely proportional to a refractive index of the coating. The examiner further wishes to point-out that applicant's specification further fails to define or make clear these claimed limitations, and therefore the rejections of independent claims 1, 8, 15 under USC 102(e) stands as rejected.

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Allowable Subject Matter

6. Claims 22-28 are allowed over the prior art of record.
7. The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 22, the prior art fails to disclose or make obvious a flying height tester for a recording head of a hard drive having a computer that is coupled to the photodetector and determines a flying height, said coating thickness having a value so that a minimum intensity level of the reflected light beam is at a negative flying height, and in combination with the other recited limitations of claim 22. Claims 23-28 are allowed by the virtue of dependency on the allowed claim 22.

It is the examiner's position that the negative flying height is when the coating thickness is $\text{wavelength}/(4n_c)$ and the layers are aligned in the same direction. In order for the air to cancel the layers, the substrate must rotate clockwise indicating that the flying height at which the intensity is a minimum is negative.

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

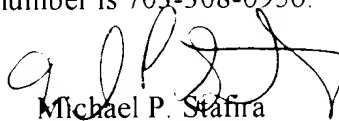
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CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael P. Stafira whose telephone number is 703-308-4837. The examiner can normally be reached on 4/10.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank Font can be reached on 703-308-4881. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7721 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.


Michael P. Stafira
Primary Examiner
Art Unit 2877

June 26, 2003